[234] 334 is a sensor that measures the die substrate temperature. The measured data is then converted to a digital format by the analog-to-digital converter (ADC) 330 and then provided to the controller 200 as the digital_temp signal. The controller 200 then retrieves (from the EEPROM 130) new DAC settings for $I_{mod}$, $I_{bias}$, $T_{pkw}$, $I_{pkd}$ based upon the temperature. The new DAC settings are stored in registers (e.g., $I_{mod}$ register 210, $I_{bias}$ register 214, $T_{pkw}$ register 218, $I_{pkd}$ register 224). Preferably, the registers (herein referred to also as DAC registers) are disposed inside the DACs 234. The DACs 234 use the current DAC values in these registers (210, 214, 218, 224) to set the VCSEL drive waveform parameters.

**In the claims:**

1. (Amended) An optical transmitter comprising:

an array having at least one semiconductor laser;

a memory for storing drive waveform parameters; and

a driver circuit, coupled to the memory and the array, having an age compensation mechanism and a temperature compensation mechanism, for receiving data signals and at least one drive waveform parameter, and responsive thereto, for generating at least one drive waveform to drive the semiconductor laser;

wherein the driver circuit updates at least one drive waveform parameter during the operation of the transmitter based on data from the age compensation mechanism or the temperature compensation mechanism [one of an aging factor of the array and a temperature factor of the array] and generates an updated drive waveform based on the updated drive waveform parameter.

2. (Amended) The optical transmitter of claim 1 wherein the array includes a plurality of semiconductor lasers, each of the plurality of semiconductor lasers associated with its own set of drive waveform parameters; and

wherein the driver circuit individually programs the drive waveform parameters for each semiconductor laser to increase the uniformity in the resulting optical waveforms

of the semiconductor lasers, the drive waveform parameters including ac and dc properties.

9. (Amended) [A] An open-loop laser driver for generating drive waveforms that drives an array having at least one semiconductor laser, each drive waveform associated with its own set of drive waveform parameters, comprising:

a digital controller integrated with the laser driver;

wherein the digital controller initially programs and selectively adjusts during the operation of the driver at least one parameter associated with the drive waveform.

16. (Amended) A method for providing a drive waveform for at least one semiconductor laser in [a] an open-loop laser driver having an integrated controller and a storage for storing drive waveform parameters, the method comprising the steps of:

initially setting at least one drive waveform parameter; and

adjusting the drive waveform parameter during the operation of the laser driver based on one of a temperature factor and an aging factor.

## REPLACEMENT DISCLOSURE

**Pg 12, line 18 - pg 13, line 3**

Temperature Measurement Block 334

As the VCSEL operating parameters need to change over time or temperature, the controller 200 updates the drive parameters in real time. For example, adjustments for temperature can occur periodically (e.g., in intervals of 30 milliseconds). In one embodiment, the temperature compensation mechanism 250 can be implemented in part by a temperature measurement block (TMB) 334 and an analog to digital converter 330. The temperature measurement block (TMB) 334 is a sensor that measures the die substrate temperature. The measured data is then converted to a digital format by the analog-to-digital converter (ADC) 330 and then provided to the controller 200 as the digital_temp signal. The controller 200 then retrieves (from the EEPROM 130) new DAC settings for $I_{mod}$, $I_{bias}$, $T_{pkw}$, $I_{pkd}$ based upon the temperature. The new DAC settings are stored in registers (e.g., $I_{mod}$ register 210, $I_{bias}$ register 214, $T_{pkw}$ register 218, $I_{pkd}$ register 224). Preferably, the registers (herein referred to also as DAC registers) are disposed inside the DACs 234. The DACs 234 use the current DAC values in these registers (210, 214, 218, 224) to set the VCSEL drive waveform parameters.

## REPLACEMENT CLAIMS

1. (Amended) An optical transmitter comprising:

an array having at least one semiconductor laser;

a memory for storing drive waveform parameters; and

a driver circuit, coupled to the memory and the array, having an age compensation mechanism and a temperature compensation mechanism, for receiving data signals and at least one drive waveform parameter, and responsive thereto, for generating at least one drive waveform to drive the semiconductor laser;

wherein the driver circuit updates at least one drive waveform parameter during the operation of the transmitter based on data from the age compensation mechanism or the temperature compensation mechanism and generates an updated drive waveform based on the updated drive waveform parameter.

2. (Amended) The optical transmitter of claim 1 wherein the array includes a plurality of semiconductor lasers, each of the plurality of semiconductor lasers associated with its own set of drive waveform parameters; and

wherein the driver circuit individually programs the drive waveform parameters for each semiconductor laser to increase the uniformity in the resulting optical waveforms of the semiconductor lasers, the drive waveform parameters including ac and dc properties.

9. (Amended) An open-loop laser driver for generating drive waveforms that drives an array having at least one semiconductor laser, each drive waveform associated with its own set of drive waveform parameters, comprising:

a digital controller integrated with the laser driver;

wherein the digital controller initially programs and selectively adjusts during the operation of the driver at least one parameter associated with the drive waveform.

16. (Amended) A method for providing a drive waveform for at least one semiconductor laser in an open-loop laser driver having an integrated controller and a storage for storing drive waveform parameters, the method comprising the steps of:

initially setting at least one drive waveform parameter; and

adjusting the drive waveform parameter during the operation of the laser driver based on one of a temperature factor and an aging factor.